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PASSARGE'S PRINCIPLES OF LANDSCAPE DESCRIPTION

By W. M. DAVIS

Dr. Siegfried Passarge, known fifteen years ago for his explorations in South Africa, where he came upon the important idea of "leveling without base-leveling," and subsequently professor of geography at the University of Hamburg, has frequently urged the importance of carefully studying the facts of the visible landscape before attempting to explain them. He now makes practical application of this manifest principle in a textbook, "Beschreibende Landschaftskunde," the first part of a contemplated four-volume work, "Die Grundlagen der Landschaftskunde," which is as a whole intended to serve as a guide to the investigation and description of the visible features of geographical areas in their natural combinations. It is well said in the introduction to the first volume, now issued,¹ that the study of the visible landscape is a branch of geography which has at last secured the place it should have long since occupied; for a knowledge of geographical spaces and their contents is the indispensable foundation on which all geographical descriptions and generalizations must be built; and it is furthermore held to be a scientific necessity that the study of landscapes, including their land forms, atmospheric effects, plants, animals, and human inhabitants, as they are actually seen to occur together, should begin with an empirical description of facts of observation, uninfluenced by theoretical or explanatory preconceptions. The volume before us aims to assure the accomplishment of this empirical task.

SYSTEMATIC ANALYSIS OF LANDSCAPES

The first 15 pages present a systematic analysis of landscapes (*planvolle Landschaftszergliederung*), which is intended to aid the observer towards thorough work by compactly listing the many kinds of features of which landscapes may be composed. Thus atmospheric effects are allowed 76 headings; land forms, together with streams, lakes, and shore lines, several hundred; plants, animals, and man are treated with similar liberality. As examples, under the relation of lakes to rivers, we find *Blindseen*, *Quellseen*, *Endseen*, *Durchgangsseen*, *Hochflutseen*, *Haffe*, *Limane*, *Deltaseen*; under cliff coasts, *Hohlkehle*, *Grotten*, *Höhlen*, *Tore*, *Klifkanäle*, *Klifdolinien*, *Klifnischen*, *Strandstufen*, *hängende Täler*, *Felsenstrand*, *Felsenwatt*; under plan of settlements, *Einzelhöfe*, *Einzelgehöftdörfer*, *Haufendörfer*, *Runddörfer*, *Strassendörfer*, *Kettendörfer*,

¹ Siegfried Passarge: Die Grundlagen der Landschaftskunde: Ein Lehrbuch und eine Anleitung zu landschaftskundlicher Forschung und Darstellung, Band I, Beschreibende Landschaftskunde. 210 pp.; diagrs., ill. L. Friederichsen & Co., Hamburg, 1919.

Festungsdörfer, Waldinseldörfer, Festungen, Burgen, befestigte Gemarkungen. It is not to be doubted that these lists will aid the otherwise untrained traveler in making thorough notes, for few travelers possess either a good enough power of observation to recognize or a sufficiently extended vocabulary to name the manifold features that they encounter.

DESCRIPTION OF VISIBLE LANDSCAPE FEATURES: LAND FORMS

The meaning of the terms listed in Part I is explained in Part II, "Beschreibende Landschaftskunde," which occupies three-quarters of the book. The method here adopted may be illustrated by the treatment of land forms. These fundamental features are first classed as individual and as composite forms (*Grundformen und Gruppenformen*). The individual forms are mountains, valleys, plains, etc., each of which is composed of certain elements that cannot exist alone; thus a mountain has a summit, slopes, and base; a valley has sides, floor, and river channel. Composite forms, such as mountain ranges, are made up of many individual peaks, domes, and ridges; and composite forms are associated in larger regions and zones. The classification is thorough, sometimes to the point of being labored, as is indicated by the three lists of terms given above. The variety of forms treated is great, and a knowledge of them is profitable; but, as might be expected in any such text, certain items of equal rank with those included are not mentioned. Among omitted items are: the varied forms of spurs in incised meandering valleys, the frequently occurring "underfit" relation of stream curves to incised-valley curves, the cusps and concaves of terrace fronts, the upstream breaking of standing waves in rushing torrents, the prevalently discordant junction of small and large stream beds, the daily length-variations of mountain-ravine streams in arid regions, the reflection of waves from partly submerged cliff faces, the refraction of surf so that it arrives on beaches nearly coincident with their curves, the relation of beach detritus to the rock floor on which it usually lies, the peculiar behavior of 'long-shore tidal currents with relation to high and low water, the color of sea water on coral-reef flats. It is not so much the number as the significance of these omitted items that is striking.

AVOIDANCE OF EXPLANATORY TERMS

The effort to avoid explanatory terms and to limit the definitions and descriptions of individual forms to empirical statements is remarkably successful, although it evidently involves the suppression of elementary explanations that are perfectly familiar to the author, for they are well established and universally accepted. The names given to individual and composite forms are also in nearly every case free from explanatory implication, although this cannot be said of *Durchbruchstal* and *Vulkan*. Many names, like *Ringwallwasserscheide*, *Zwischengebirgstäler*, and *Fluss-*

mündungsküste, are compounded in a manner to which the German language lends itself with exceptional facility. Yet, in spite of the intention to give purely empirical definitions, explanatory inferences creep in here and there and clearly carry the brief descriptions beyond the narrow limits of direct observation. For example, *zerplatzte Felsblöcke* is the phrase applied to the severed parts of a weathered boulder, although its splitting is inferred and not seen. Mountain torrents are said to lay down their detritus in fans where they enter a main valley, although even if an observer happens actually to see a small volume of detritus thus deposited, it is only by inference that he knows the entire fan to be of similar origin. Flood plains are said to show various signs of past and hence inferred flood action, such as deposits of sand and gravel, or old and fresh stream channels. The diagram of a longitudinal valley-terrace includes a foreground section in block-diagram style, in which valley-floor alluvium is drawn as lying upon an inferred underground extension of the valley sides. Likewise, the block diagrams of certain concentrically grouped ridges of oval ground plan, to which the names of *Kragenberg* and *Kragenwallberg* are given, show in their frontal sections that the ridges are the surface expression of inferred but invisible underground structures of anticlinal and synclinal arrangement. The distributaries of a river on a delta are said to flow between self-made levees. Marshy coasts are said to be formed where rivers deposit their sediments, although deltas are not similarly explained. Cliff-foot caves are said to be excavated by the surf, although gorges are not ascribed to stream erosion. A gravel-covered bench in a sea-facing cliff is named *gehobene Strandstufe*, yet embayed coasts are not explained by the submergence of valleys. "Islands become land-tied, bays are filled up." As to coral reefs, "one gains the impression that a high island sinks and its fringing reef survives as a smaller atoll, or its barrier reef as a larger one;" and the sections by which fringing and barrier reefs are illustrated show the extension of an inferred foundation slope from the island beneath the reef.

In the chapter on man, inferences as to the reasons by which the location of villages has been determined are frequently suggested; indeed, although the treatment professes to be purely descriptive, human settlements are explicitly said to be usually determined by such factors as soil, water, or plant growth, thus indicating the recognition of a highly reasonable explanatory preconception as to cause-and-effect relations; yet such causal relations clearly lie beyond the reach of direct observation, in so far as they concern the reason for the location of a village. Furthermore, certain villages in peculiar situations, difficult of access, are called refuge villages; towns on the higher bank of a stream were placed there to avoid overflow during floods; river fords and bridgeable narrows are treated as frequent causes of village or city location; a special explanation is given for the peculiar location of some small settlements away from the springs of an

arid region (p. 148); and a socialistic extension of observation into prediction is found in the statement: "Factories are like bombs with time fuses. . . . When industrialism prevails, it sooner or later leads irremediably to disaster."

These failures to present purely empirical definitions and descriptions illustrate the natural and constantly increasing habit of treating geographical matters rationally in these modern days of evolutionary philosophy; but they form so small a part of the text that they do not seriously lessen the value of Passarge's book as an empirical "Beschreibende Landschaftskunde." As has been said, a knowledge of all the features here described would be of great value to every geographer, and especially to the traveler who, untrained in geography, nevertheless wishes to make some record of his geographical observations.

THE OUTLINE ILLUSTRATIONS

The meaning of a good number of the terms is made clearer by small figures in the text, among which those illustrating different kinds of human settlements are to be particularly commended, as most of them seem to be copied from authentic pictures of actual examples. Unfortunately the same cannot be said of the small figures of land forms, reproduced from drawings by Passarge's laboratory assistant; many of them are seriously inadequate, in that they are not accurate representations of actual *Grundformen* taken from existing landscapes but are roughly drawn ideal figures, many of their lines being inexpressive to the point of inaccuracy. Some of the illustrations are mere profiles which, as in certain instances already noted, not only depart from the plan of the book by showing inferences concerning invisible underground structures but also fail fully to realize the object of the book by not giving its readers good presentations of surface facts. Such bare profiles may serve to summarize the impressions of an observer who has seen the facts out of doors, but they do not suffice as indoor reproductions for students who have not seen the facts. Other illustrations are schematic diagrams, which appear to have been designed by an artist inexperienced in sketching the original objects rather than to have been drawn from nature by a skillful and critical observer. The volume of a river in a narrow and steep-sided mountain valley is enormously exaggerated; flood-plain scrolls, inappropriately named *Halbmonde*, are not shown in their characteristic pattern; the scrappy little marks intended to represent a talus-covered slope beneath a rocky knob are most inexpressive; two elongated table mountains are shown with flat tops and sharply defined rims, but they have no well-developed cliffs, by the upper edge of which alone their rims can be sharply defined; a cliff-rimmed mesa, or *Kranzberg*, has a thin cliff-making stratum at mid-height, correctly drawn on its left profile but incorrectly drawn on its right profile. Empirical descriptions may, of course, be based on these inadequate drawings if

desired, but in a book that professes to hold closely to facts and that excludes all explanatory terms and rational descriptions, drawings so rough, not to say misleading, as some of these are seem out of place.

DESCRIPTIONS OF ACTUAL LAND AREAS

The last 35 pages of the book are occupied by a supplement, containing nearly eighty empirical descriptions of actual land areas, intended to serve as examples for imitation. Over fifty of these descriptions are based on Baedeker maps; about twenty more are prepared from pictures, some of which are cited in certain books of travel, while others are here given in plates at the end of the text. One of these views, a drawing from a model of the Mont Blanc group, is seriously wrong in failing to show the strong discordance of levels between the hanging side trough of the Mer de Glace and the overdeepened main trough of Chamonix. It is interesting to note that in a number of these empirical descriptions, Passarge guards some of his statements of fact by qualifying them with "*anscheinend*" or "*augenscheinlich*," just as geographers who prefer explanatory descriptions use similar words to indicate doubt as to the explanations they propose. Some of the descriptions extend, apparently by inference, beyond the facts shown in the pictures; as in making mention of *Sand* on an arid plain, and of *Schutt* on a distant mountain slope. Preconceptions are occasionally implied, as in the use of *zerschnitten* in describing mountain slopes, of *gerundet* instead of *rund* in describing a certain ridge crest, and of *einschneidend* in describing a certain valley. In general, however, the descriptions hold closely to the facts. One of the best examples (p. 170) is only 16 lines in length.

Über einer mässig steilen, zerschluchteten Buschwaldböschung erhebt sich eine schroffe, kahle, zerklüftete Felsenmauer als Gipfel des wohl +1000 m hohen Tafelberges, dessen Oberfläche eine von waldigen Randschluchten zerschnittene, wellige Grasflur bildet. Aus den Gehängeschluchten heraus entwickeln sich in der Ebene gewundene, steil eingeschnittene Galeriewaldflüsse, die von trockenen, grasigen Überschwemmungsflächen mit zerstreuten Palmen eingefasst werden. Zwischen den Flüssen erheben sich niedrige, gelblich-bräunliche Baumsavannen-Platten, die mit steilem Rand zu der grünen Überschwemmungssohle abfallen. Aus den emförmigen Flächen der Steppenplatten ragen die kahlen Rotlehmkegel der Termiten auf. Rundliche Buschwaldinseln erfüllen den Boden von flachen Sandpfannen, die hier und da eingesenkt sind. In der Überschwemmungs-Grasflur weiden Herden von Antilopen, deren Wechsel als schmale rote Linien die Savannenplatten durchziehen. Aus einer Schlucht des Berges aufsteigender Rauch verrät die Schlupfwinkel eines Stammes, der sich in die unzugängliche Fels- und Buschwildnis des Berges zurückgezogen hat.

This may well serve as a model, so vividly does it present a picture of the landscape it describes; and yet even this model contains light touches of explanation, for it suggests the inferred action of an inorganic process in using "*eingeschnitten*" to describe certain streams, and an inferred human motive in using "*zurückgezogen*" in telling of the nearly inaccessible refuge of a savage tribe. Without doubt the study of a moderate number

of such descriptions and the preparation of several more would be beneficial to all earnest students of geography; but it is hard to believe that the lesson to be thus learned is so difficult that the many sample descriptions here given are necessary.

THE VOLUME AS A UNIVERSITY TEXTBOOK

The logic of Passarge's method is beyond dispute, and, as has already been pointed out, his present book must prove highly serviceable to travelers who do not profess to be geographers but wish to give some account of their travels. Such observers would be greatly aided by the introductory suggestions in the "*Planvolle Landschaftszergliederung*" and by the descriptive definitions in the body of the book. But that a book of this nature should be regarded as an essential foundation for university instruction in geography, especially for beginners, is quite another matter. The propriety of giving so much space to the empirical first step of university instruction in geography is pedagogically very questionable. No one disputes the necessity for abundant observational study of geographical facts. No one proposes to describe landscapes by substituting theoretical explanations for direct observation. Even those geographers who wish to replace empirical description by explanatory description as far as it is reasonably possible to do so, fully agree that, when an actual landscape is to be described, the observation of its features must come first and their description, of whatever kind, second. This is logically inevitable; but it by no means follows that the preparatory indoor study, which is for the most part non-observational, must be even in its introductory stage limited to empirical definitions and descriptions, from which all rational, explanatory treatment is excluded. It would be a most melancholy error if all inquiry as to cause should be repressed while a book of 210 pages is studied through. To what extent and by what method Passarge proposes eventually to use explanatory terms and descriptions will appear in the later parts of his four-volume work. In the meantime the first step of his procedure, as now presented, may be evaluated.

A high value unquestionably attaches to a knowledge of a large variety of empirically defined types and to the preparation of empirical records of directly observed facts; but in teaching university students it is by no means necessary to continue such exercises so far as Passarge's book demands before any explanatory description is permitted. Indeed, it may be well urged that, while a certain amount of indoor practice in empirical description from maps and pictures is useful, the best occasion for practice in the empirical description of observed facts is found during outdoor excursions, which should therefore be conducted slowly enough to allow time for deliberate sketching and description while the objects to be described are in sight. In contrast with these observational outdoor exercises, the greater share of indoor study may well be given to theoretical explanations, the

consideration of which should not be long delayed. Indeed, the postponement of explanation for so long a time as the use of Passarge's book would demand has no parallel in the teaching of other sciences. In geometry the many facts concerning points, lines, distances, surfaces, angles, areas, solids, and volumes are not all first defined empirically and afterwards reviewed with demonstrative explanations; rational treatment is from the beginning closely associated with definition. Any other procedure would be fatiguing and discouraging. Students of physics are not required to observe and describe a large variety of phenomena before any account of invisible theoretical matters is introduced. Observation, description, and explanation are closely associated in laboratory work, textbook study, and lectures, as the successive subdivisions of physics are learned.

Similarly a close association of rational explanation with observation and description is desirable in geography. Inquiries as to meaning and cause must inevitably arise during the presentation of a series of geographical facts to a class of right-minded, bright-minded young students; and it would be most unfortunate if the teacher should attempt to suppress such inquiry by announcing that all explanations must be postponed until the next semester. Inquiry as well as observation should be encouraged and utilized; for at the moment of inquiry the student mind is as ready for the reception of an explanation as a chemical element in the nascent state is ready to enter into a new combination. Reasonable care should of course be used as to the confidence with which the explanatory treatment of different landscape factors is introduced; but, as far as land forms are concerned, it would surely be unreasonably skeptical today to exclude mention of the work of weather and streams in the description of mountains and valleys, of submergence in the study of embayed coasts, of glacial erosion in telling about cirques and hanging valleys, of glacial deposition in telling about drumlins and till plains, and of various other explanatory processes in giving accounts of many well-understood landscape features. It is probable that zoögeographers and anthropogeographers would hold similar opinions as to the treatment of many problems concerning the well-understood organic elements of landscapes.

If a teacher, in attempting to carry out a dry logical plan, excludes all explanatory treatment for several months from so rationally treatable a subject as the geographical landscape, his students will outdistance him, especially if they have already had an introduction to rational geography before entering upon their university studies; for unless they are an exceptionally dull lot, their inquiring minds will spontaneously refuse to be stifled: if their teacher will not discuss explanations with them, they will discuss explanations with one another.

A textbook that imposes upon those who use it a prolonged empirical treatment, from which all the refreshing juice of explanation has been squeezed out, has a savor of heavy laboriousness. Such a book, unless in

the hands of an experienced explorer who could not refrain from now and then adding an invigorating flavor of explanation, would make dull grinds out of its students and exacting Gradgrinds out of its teachers. It is difficult to understand how its arid method can be advocated by a man so experienced in exploration and so expert in explanation as Passarge.

How different were the educational principles of Gilbert, our American master of geomorphology! He thought that the important thing in education is to train scientists rather than to teach science and that "the practical questions for the teacher are whether it is possible by training to improve the guessing faculty and, if so, how is it to be done:" he furthermore believed that the content of a science is often presented so abundantly as to obstruct the communication of its essence and that the teacher "will do better to contract the phenomenal and to enlarge the logical side of his subject, so as to dwell on the philosophy of the science rather than on its material."

It would be imprudent to predict how far German professors and German students of geography will be content to accept so tediously prolonged an empirical introduction to their science as the "Beschreibende Landschaftskunde" imposes; but, except that it may have a certain value as a work of reference in association with texts of an explanatory nature, a book of this kind is not likely to be used in the United States.